

REMARKS/ARGUMENTS

These remarks are made in response to the Office Action of June 15, 2007 (Office Action). As this response is timely filed within the 3-month shortened statutory period, no fee is believed due. However, the Examiner is expressly authorized to charge any deficiencies to Deposit Account No. 50-0951.

In the Office Action, Claims 1-3, 5, 6, 8-10, 13-20, 22, 23, 25-27, and 30 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Published Patent Application 2004/0260543 to Horowitz, *et al.* (hereinafter Horowitz). Claims 7 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Horowitz in view of U.S. Patent 5,261,009 to Bokser (hereinafter Bokser). Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Horowitz in view of Bokser, and in further view of U.S. Patent 5,754,972 to Baker, *et al.* (hereinafter Baker). Claims 11, 12, 28, and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Horowitz in view of Bokser, and further in view of U.S. Published Patent Application 2003/0004717 to Strom, *et al.* (hereinafter Strom).

Although Applicants respectfully disagree with the rejections, Applicants nevertheless have amended certain claims so as to expedite prosecution of the present application by emphasizing certain aspects of the invention. Applicants respectfully note, however, that the amendments are not intended as, and should not be interpreted as, the surrender of any subject matter. Accordingly, Applicants respectfully reserve the right to present the original version of any of the amended claims in any future divisional or continuation applications from the present application.

In particular, Applicants have amended independent Claims 1, 13, 18, and 30 to further emphasize certain aspects of the invention. As discussed herein, the claim amendments are fully supported throughout the Specification. No new matter has been introduced by virtue of the claim amendments.

Aspects Of Applicants' Invention

In may be useful to reiterate certain aspects of Applicants' invention prior to addressing the cited references. One embodiment of the invention, typified by Claim 1, is a method for processing language input.

The method can include determining at least two possible meanings for a language input and, for each possible meaning, determining a probability that the possible meaning is a correct interpretation of the language input. The method also can include computing at least one relative delta computation based at least in part upon the determined probabilities. Each value of a relative delta computation, more particularly, can uniquely correspond to a type of irregularity with the language input such that values of relative delta computations varying depending on the corresponding type of irregularity. (See, e.g., Specification, paragraph [0008], 1-9; and paragraph [0027], lines 1-3; see also paragraph [0049], lines 1-5.)

The method further can include detecting at least one irregularity within the language input and determining the corresponding type of the at least one irregularity based upon the relative delta computation. (See, e.g., Specification, paragraph [0011], lines 1-8; paragraph [0026], lines 5-8; and paragraph [0027], lines 1-3; see also paragraph [30], lines 1-6, and paragraph [0049], lines 1-5.) Additionally, the method can include performing at least one programmatic action responsive to detecting the irregularity.

The Claims Define Over The Cited References

As already noted, independent Claims 1, 13, 18, and 30 were each rejected as being anticipated by Horowitz. Horowitz is directed to "data selection mechanism for identifying a single data item from a plurality of data items." (Abstract, lines 1-4.) Applicants respectfully submit, however, that Horowitz fails to explicitly or inherently teach every feature recited in independent Claims 1, 13, 18, and 30.

One aspect of Applicants' invention is a technique for using results, such as the top-N results, generated through natural language classification to determine different types of "irregularity" present within a received language input. Based upon such a determination, it can be decided, for example, whether the results should be rejected, should be considered ambiguous, or whether the results are compound – requiring that they be combined into a single compound result. More particularly, the technique involves the computation of "relative delta" scores between successive pairs of the results. This relative delta score can indicate the closeness of successive results relative to each other, and are a basis for determining the type of irregularity present. This is one of the differences between Applicants' invention and Horowitz, as well as each of the other cited references.

Horowitz is directed to a technique for collecting multiple pieces of related information such parts of an address, and more particularly, on how best to collect the next piece of information given a previous input. Horowitz indeed uses the n-best results for each input, but only so as to combine them with n-best results of the next input.

By contrast, Applicants' invention provides a mechanism by which it can be determined whether the results of a current language input produced with a natural language classification model are, for example, acceptable, ambiguous, or compound or whether the results should be rejected. Horowitz, however, is concerned only with using the results of a current audio input to constrain the possible responses for a subsequent audio input. Consequently, the context, application, scope and methods described by Horowitz are very different from Applicants' invention, even though Horowitz refers to common terminology such as "n-best" and "confidence scores."

More particularly, Horowitz, fails to teach, for example, the computation or use of a relative delta computation. Specifically, Horowitz fails to provide any mechanism for obtaining relative delta computations. None of the values obtained with Horowitz's system or method are values that uniquely correspond to a type of irregularity within a

language input such that the values vary depending on the corresponding type of irregularity, as recited in Claims 1, 13, 18, and 30.

As an example of Horowitz's type of pattern matching, Horowitz describes a process of identifying which of multiple postcodes associated with a street name is one contained in a list derived from a "first user utterance." (Horowitz, paragraph [0069].) In a portion cited at page 2 of the Office Action as describing a relative delta computation, Horowitz describes this process:

"Each of these candidate postcodes are compared with the original n-best list of possibilities L_1 . There are three possibilities:

1. There are no matches, (path 104) in which case a recovery process is begun;

2. There is one unique match (107). This value is proposed by the SLI to the user at step 110. If the user confirms the match as correct, the value is returned to the system and the process ends at step 112. If the user denies the result, the recovery process is begun, (step 116).

3. Finally, if the match provides several possibilities (step 106), the system examines the combined confidence of each postcode and street name pairing at step 108 to resolve the ambiguity. The highest scoring pair is selected and returned to the user who is invited at 110 to confirm or deny that postcode. If confirmed, the result is returned at 112 and the procedure ends. If denied, the recovery process is entered at 114." (Horowitz, paragraph [0071], line 8 – paragraph [0074], line 8.) (Emphasis supplied.)

The quoted language merely describes examining "combined confidence" scores, the highest one of which is associated with a possible match between a postcode and street name. Horowitz's combined confidence scores, however, are not associated with any type of identifiable irregularity within a language input. More fundamentally, Horowitz's combined confidence scores do not in any manner vary depending on the *type* of

irregularity. Indeed, Horowitz does not even contemplate different types of irregularities, let alone distinguishing among different ones, as expressly recited in Claims 1, 13, 18, and 30. It follows that Horowitz fails to teach, either expressly or inherently, computing relative delta computations whose values uniquely correspond to a particular type of irregularity within a language input such that values of relative delta computations vary depending on the corresponding type of irregularity, as expressly recited in Claims 1, 13, 18, and 30.

It further follows that in failing to generate relative delta computations, Horowitz is unable to determine different types of irregularities for a language input that has been determined to contain an irregularity. Specifically, Horowitz fails to teach determining the corresponding type of at least one irregularity based upon a relative delta computation, as also recited in Claims 1, 13, 18, and 30.

None of the other references provide for the computation of relative delta values or other values having the characteristics of Applicants' invention. Bokser merely describes a long-established measure of probability based upon relative frequency. With Bokser, probabilities are computed by dividing the total number of occurrences of a particular group trigram in a "converted source tape" by the total number of group trigrams in the converted source tape to obtain a probability value. (See Bokser, Col. 8, lines 11-34.) Again, however, this merely describes a well-known, widely-used measure of probability based upon relative frequencies. Using relative frequencies suggests nothing about computing a relative delta value of the type taught by Applicants' invention.

Bokser likewise describes the conversion of probabilities contained in confidence tables so as to facilitate using addition and subtraction rather than multiplication and division in computations involving the probabilities. Bokser's conversion, however, merely provides that each probability value is "replaced with a number proportional to the logarithm of that probability value." (See Bokser, Col. 16, lines 39-61.) (Emphasis

supplied.) Bokser's logarithmic conversion suggests nothing about the computation of relative delta values according to Applicants' invention. Each of the other references likewise describes the use of statistical methods, but without suggesting anything regarding relative delta computations of the type taught by Applicants' invention. (See, e.g., Baker, Col. 7, lines 18-55, describing standard "likelihood computations," and Strom, paragraphs [0026]-[0028], describing the determination of Maximum Likelihood Estimates (MLE) using linear interpolation.)

Accordingly, none of the cited references, alone or in combination, teach or suggest every feature recited in independent Claims 1, 13, 18, and 30. Applicants respectfully submit, therefore, that Claims 1, 13, 18, and 30 define over the prior art. Applicants further respectfully submit that whereas each of the remaining claims depends from Claim 1, 13, or 18 while reciting additional features, these dependent claims likewise define over the prior art.

CONCLUSION

Applicants believe that this application is now in full condition for allowance, which action is respectfully requested. Applicants request that the Examiner call the undersigned if clarification is needed on any matter within this Amendment, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

AKERMAN SENTERFITT



Gregory A. Nelson, Registration No. 30,577
Richard A. Hinson, Registration No. 47,652
Customer No. 40987
Post Office Box 3188
West Palm Beach, FL 33402-3188
Telephone: (561) 653-5000

Date: September 17, 2007